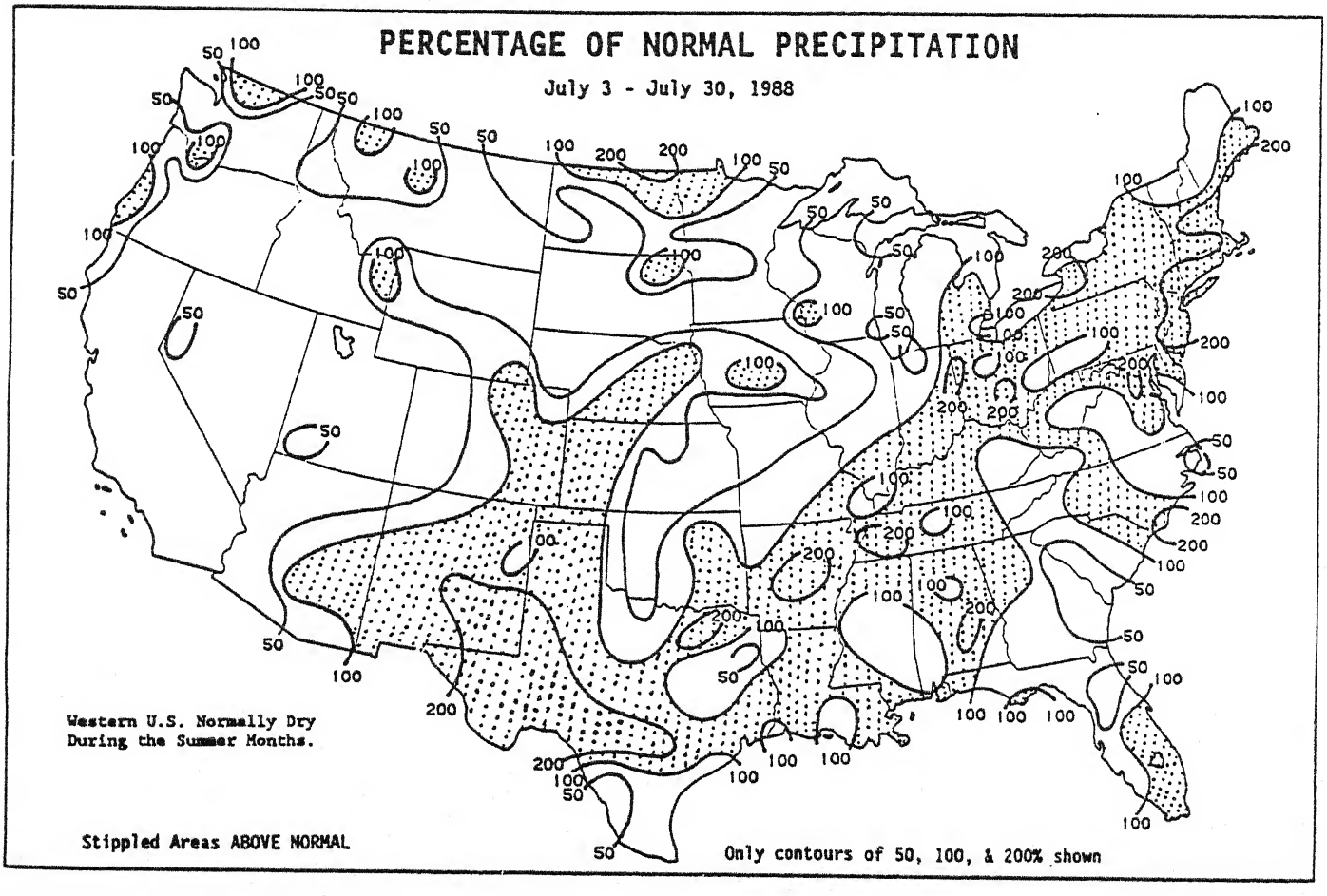
CLIMATE ANALYSIS CENTER

WEEKLY CLIMATE BULLETIN

No. 88/31 Washington, DC July 30, 1988



OVER THE PAST FOUR WEEKS, A MAJORITY OF THE EASTERN HALF OF THE U.S. HAS RECEIVED ABOVE NORMAL PRECIPITATION, PROVIDING SOME SHORT-TERM RELIEF FROM THE DROUGHT. IN THE LONG-TERM, HOWEVER, LARGE DEFICIENCIES STILL EXIST THROUGHOUT THE NORTHERN GREAT PLAINS, MIDWEST, AND SOUTHEAST. REFER TO THE SPECIAL U.S. CLIMATE SUMMARY FOR UPDATES ON THE CONDITIONS IN THE THREE AREAS.

NOAA - NATIONAL WEATHER SERVICE - NATIONAL METEOROLOGICAL CENTER

WEEKLY CLIMATE BULLETIN

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This Bulletin is issued weekly by the Climate Analysis Center and is designed to indicate, in a brief, concise format, current surface climatic conditions in the United States and around the world. The Bulletin contains:

Highlights of major global climatic events and anomalies.
U.S. climatic conditions for the previous week.
U.S. apparent temperatures (summer) or wind chill (winter).
Global two-week temperature anomalies.
Global four-week precipitation anomalies.
Global monthly temperature and precipitation anomalies.
Global three-month precipitation anomalies (once a month).
Global twelve-month precipitation anomalies (every 3 months).
Global temperature anomalies for winter and summer seasons.
Special climate summaries, explanations, etc. (as appropriate).

Most analyses contained in this Bulletin are based on preliminary, unchecked data received at the Center via the Global Telecommunication System. Similar analyses based on final, checked data are likely to differ to some extent from those presented here.

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Washington, DC 20233
Phone: (301)-763-8071

GLOBAL HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF JULY 30, 1988
(Approximate duration of anomalies is in brackets.)

1. United States and Southern Canada:

WARM, DRY CONDITIONS CONTINUE IN MANY AREAS.

Abnormally warm conditions persisted in the western and northern United States and adjacent southern Canada with temperatures as much as 4.8°C (8.6°F) above normal. Most stations across the United States reported below normal rainfall; however, some stations in New England reported as much as 121.7mm (4.79 inches) of rain. See Special Climate Summary for additional details [20 weeks dry - 13 weeks warm].

2. Europe:

ABOVE NORMAL TEMPERATURES PERSIST.

Temperatures averaged up to 5°C (9°F) above normal as unusually warm weather persisted across much of southern and eastern Europe [5 weeks].

3. China:

EXTREMELY WET IN SOME AREAS, DRY IN OTHERS.

Press reports of droughts and floods portray the extreme variability of conditions in central and eastern China. Heavy rains, up to 229.0 mm (9.02 inches), occurred at scattered stations while the driest areas reported less than 27.2 mm (1.07 inches) of precipitation [8 weeks].

4. Bolivia:

LOW TEMPERATURES PREVAIL.

Very cold conditions, with temperatures as much as 4.3°C (7.7°F) below normal, persisted across the region [4 weeks].

5. British Isles:

WET ANOMALY DEVELOPS.

Heavy rains, as much as 101.0 mm (3.98 inches) fell in Great Britain as unusually wet conditions spread across the country [5 weeks].

6. Brazil:

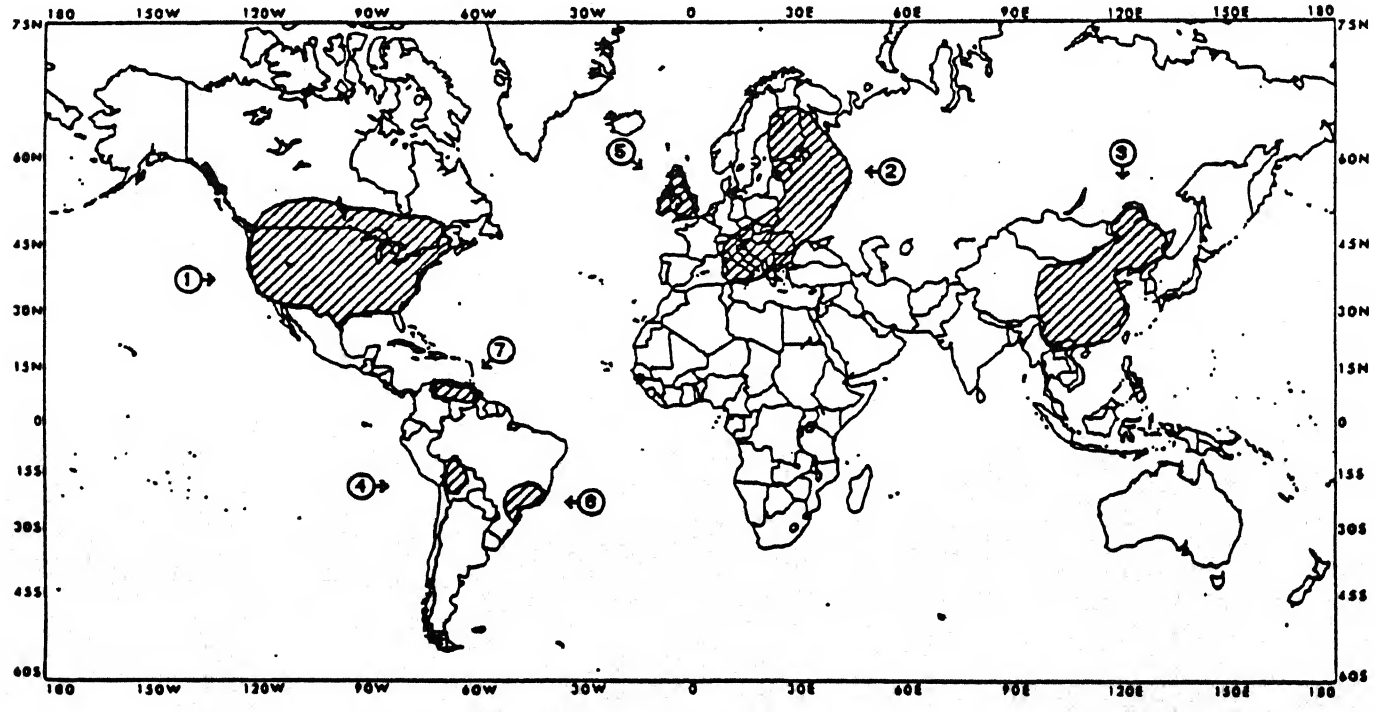
COLD WAVE HITS SOUTHERN BRAZIL.

Very cold conditions, with temperatures as much as 4.8°C (8.6°F) below normal, prevailed in south central and southeastern Brazil. See Special Climate Summary [Episodal Event].

7. Venezuela:

PRESS REPORTS FLOODS.

Heavy rains reportedly sent the Chichiriviche River over its banks and caused a landslide [Episodal Event].



Approximate locations of the major anomalies and events described above are shown on this map. See the other world maps in this Bulletin for current two-week temperature anomalies, four-week precipitation anomalies, and (occasionally) longer-term anomalies.

U.S. WEEKLY WEATHER HIGHLIGHTS

FOR THE WEEK OF JULY 24 THROUGH JULY 30, 1988

The number of stations reporting heavy precipitation in the eastern half of the country greatly diminished last week after most of the region had experienced two consecutive weeks of substantial rainfall. Much of New England, however, recorded moderate to heavy totals, especially from eastern Pennsylvania northeastward into southern Maine, as maximum amounts exceeded four inches in eastern Massachusetts (see Table 1). Other areas that measured more than two inches of precipitation included the central portions of Oklahoma, Missouri, and Virginia, southeastern Florida, northern Louisiana, southeastern Texas, the Missouri Bootheel, southeastern Alaska, and widely-scattered sections of Illinois, Indiana, Ohio, and the Carolinas. Light to moderate totals occurred in parts of the Great Basin, the southern Rockies, and the southern half of the Great Plains, in eastern South Dakota and western Minnesota, and throughout a majority of the nation east of the Mississippi River. Much of the Pacific Coast, desert Southwest, the northern halves of the Rockies and Great Plains, southwestern Texas and eastern New Mexico, northeastern Texas, lower Missouri Valley, central Kentucky, and the central portions of Alabama and Georgia received little or no precipitation. In general, rainfall in the eastern half of the U.S. over the past four weeks (since July 3) has been above normal and has provided some relief to parts of the drought-stricken areas. For further details, refer to the Special U.S. Climate Summary.

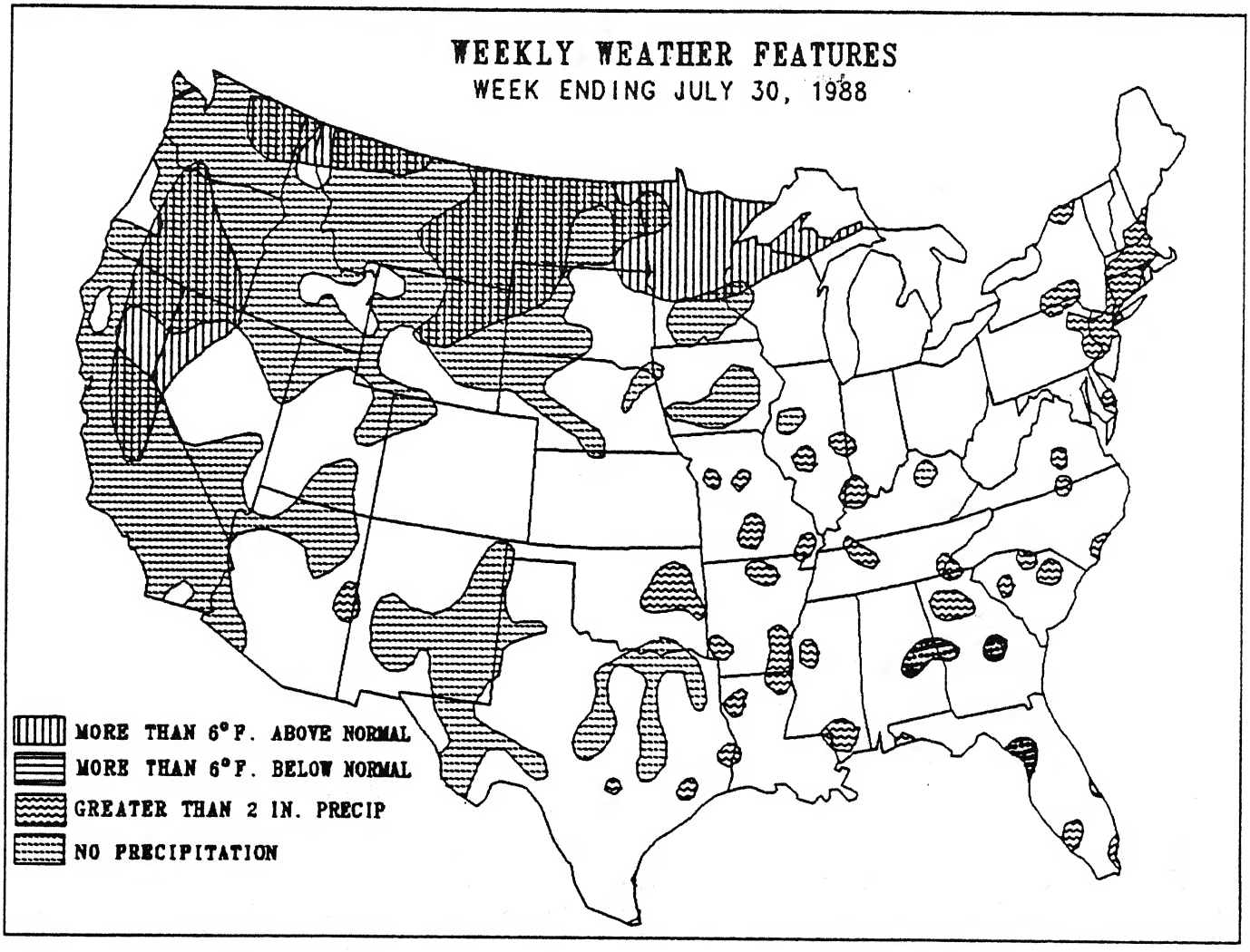
Well-above normal temperatures returned to the northern areas of the Rockies and Great Plains after the region experienced a brief one week hiatus from the heat. Warm weather prevailed for the second straight week over the Far West, especially throughout the interior Pacific Coast, as highs surpassed 100°F from the desert Southwest northward to the Canadian border. The hot conditions in the West further aggravated the region's ongoing forest fires, most notably in Yellowstone Park, and increased the fire potential throughout the western third of the U.S. The century mark was also eclipsed in much of the northern Great Plains and in parts of the central and southern Great Plains and the upper Midwest (see Figure 1). Farther east, maximum readings in the mid to upper nineties occurred in the mid-Atlantic and southern New England regions towards the end of the week. Greatest departures above normal (between +7 to +10°F) were located in the California interior, western Nevada, and from eastern Montana and northern Wyoming eastward to the western Great Lakes (see Table 2). Temperatures in the remainder of the Midwest, the Atlantic Coast states, and the southern half of the Rockies averaged near to slightly above normal. Cooler weather covered the southern and central Great Plains, most of the Southeast, and in Alaska, however, departures were generally only 1-3°F below normal.

TABLE 1. Selected stations with two or more inches of precipitation for the week.

Yakutat, AK	5.65	Salisbury, MD	2.70
Chatham, MA	4.79	San Antonio/Randolph AFB, TX	2.65
South Weymouth, MA	4.32	Fort Myers, FL	2.65
Boston, MA	3.87	Newark, NJ	2.50
Wilmington, NC	3.65	Elmira, NY	2.47
Massena, NY	3.26	Ketchikan, AK	2.30
Binghamton, NY	3.13	Philadelphia, PA	2.30
Annette Island, AK	3.09	Oceana NAS, VA	2.29
Miami, FL	2.95	Sumter/Shaw AFB, SC	2.24
Atlanta, GA	2.85	Monroe, LA	2.20
Poughkeepsie, NY	2.83	Tulsa, OK	2.19
Hartford, CT	2.81	Evansville, IN	2.19
Vero Beach, FL	2.76	Bridgeport, CT	2.10
Portsmouth, NH	2.72	Amarillo, TX	2.02
Worcester, MA	2.71	Idaho Falls, ID	2.00

TABLE 2. Selected stations with temperatures averaging greater than 6°F ABOVE normal for the week.

Station	TDepNml	AvgT(°F)	Station	TDepNml	AvgT(°F)
Jamestown, ND	+10	80	Redding, CA	+7	91
Fresno, CA	+ 9	90	Miles City, MT	+7	83
San Bernardino, CA	+ 9	87	Winnemucca, NV	+7	80
Marysville, CA	+ 8	87	Fargo, ND	+7	79
Sacramento, CA	+ 8	84	Watertown, SD	+7	79
Medford, OR	+ 8	81	Worland, WY	+7	79
Sheridan, WY	+ 8	79	Glasgow, MT	+7	79
Williston, ND	+ 8	79	Dickinson, ND	+7	78
Omak, WA	+ 8	79	Reno, NV	+7	77
Alexandria, MN	+ 8	79	St. Cloud, MN	+7	77
Eau Claire, WI	+ 8	79	Pellston, MI	+7	73
Minot, ND	+ 8	78	Duluth, MN	+7	73
Mt. Shasta, CA	+ 8	77	Cut Bank, MT	+7	72
Helena, MT	+ 8	76	Sexton Summit, OR	+7	72



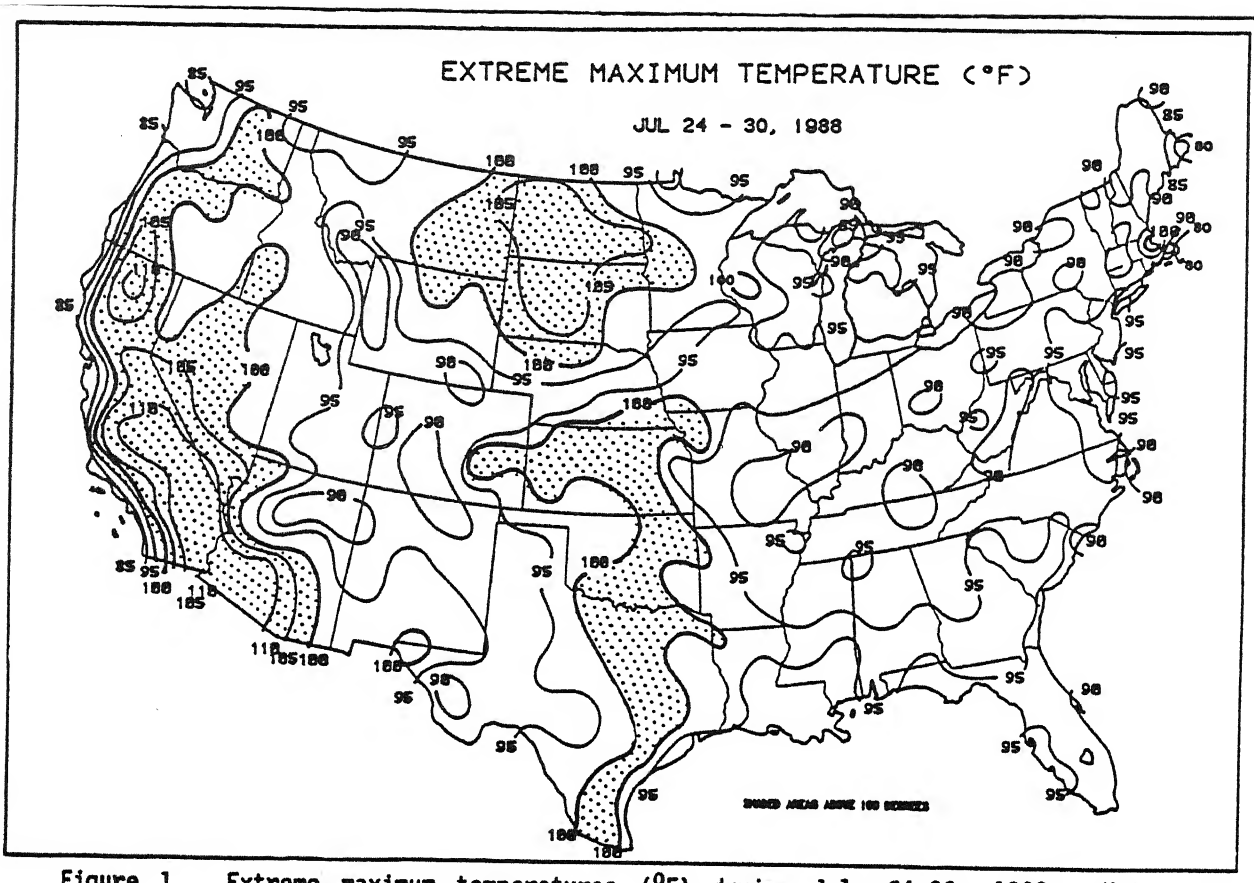
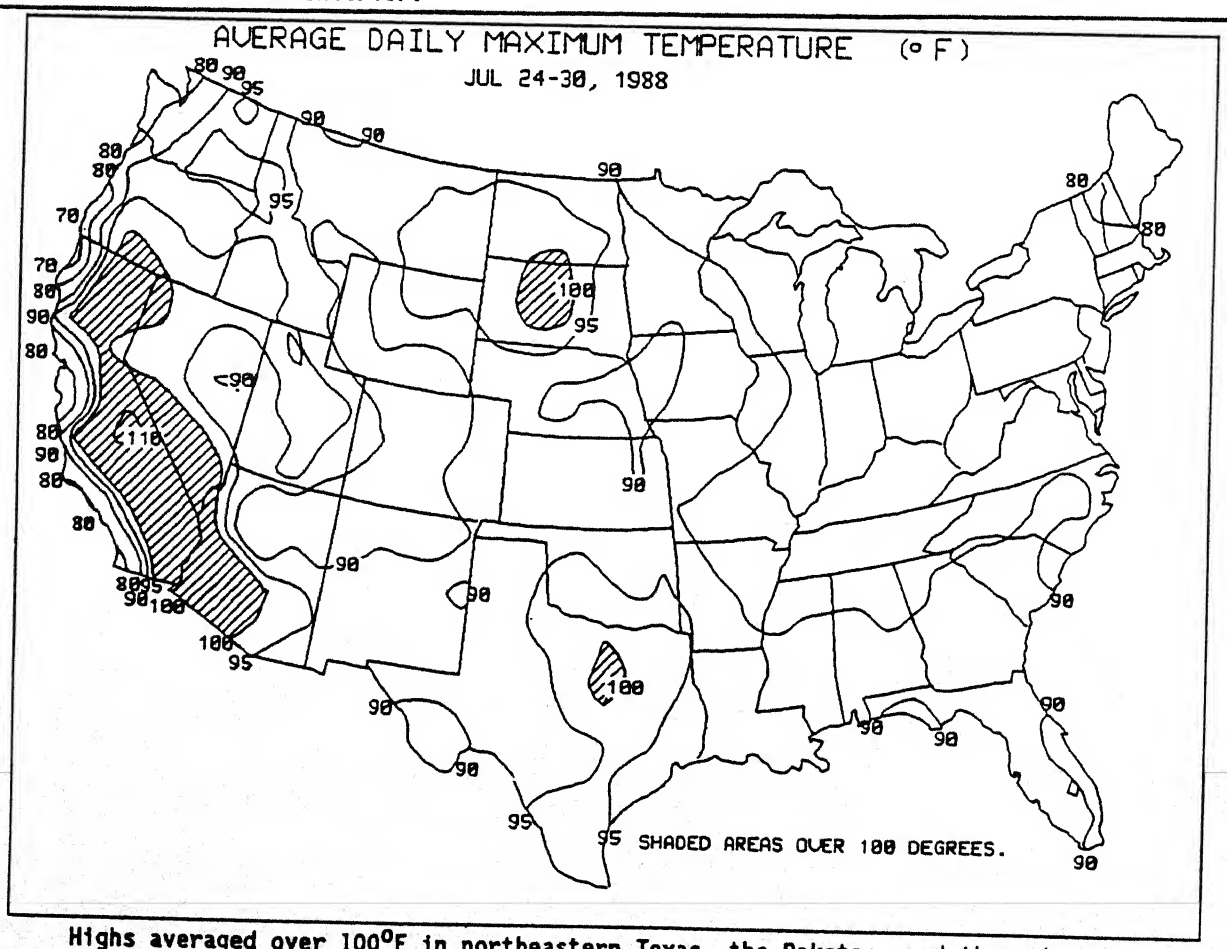
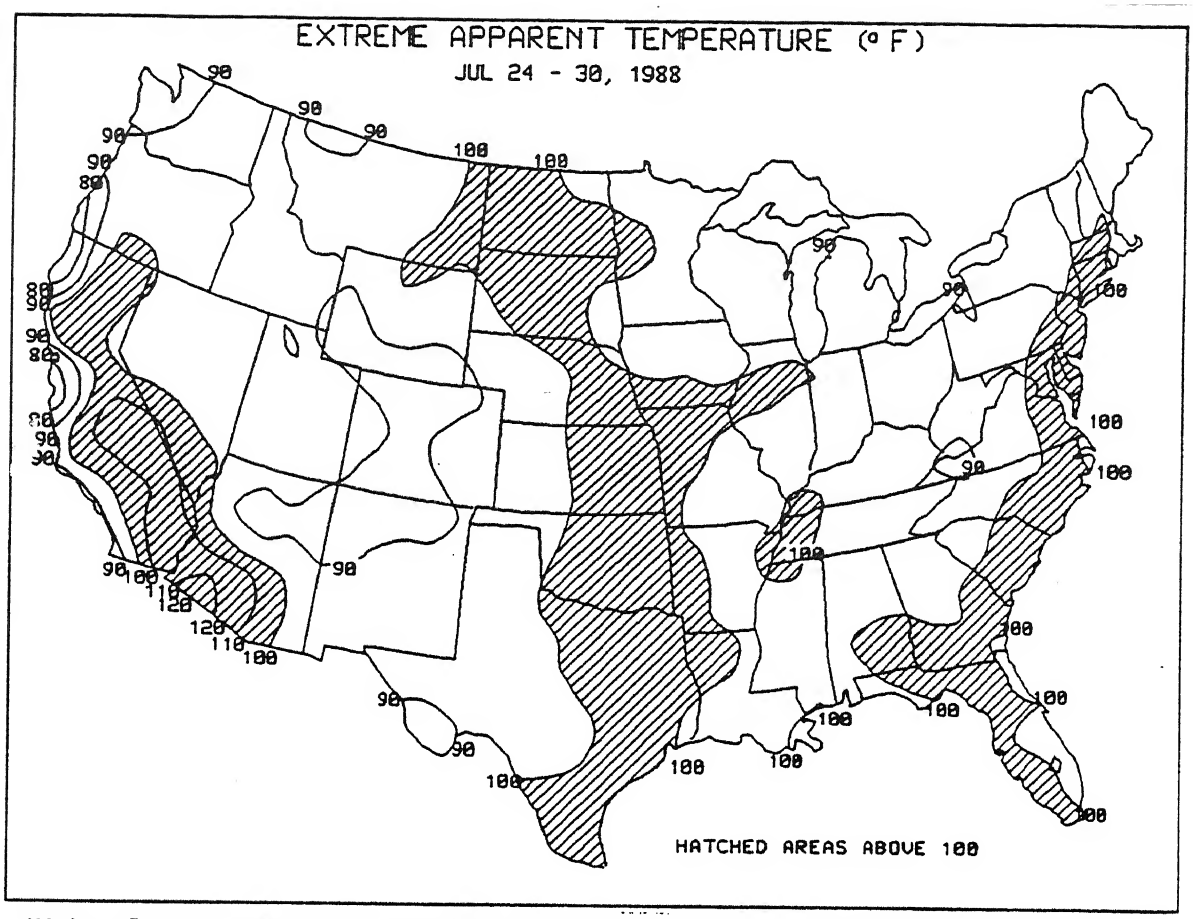


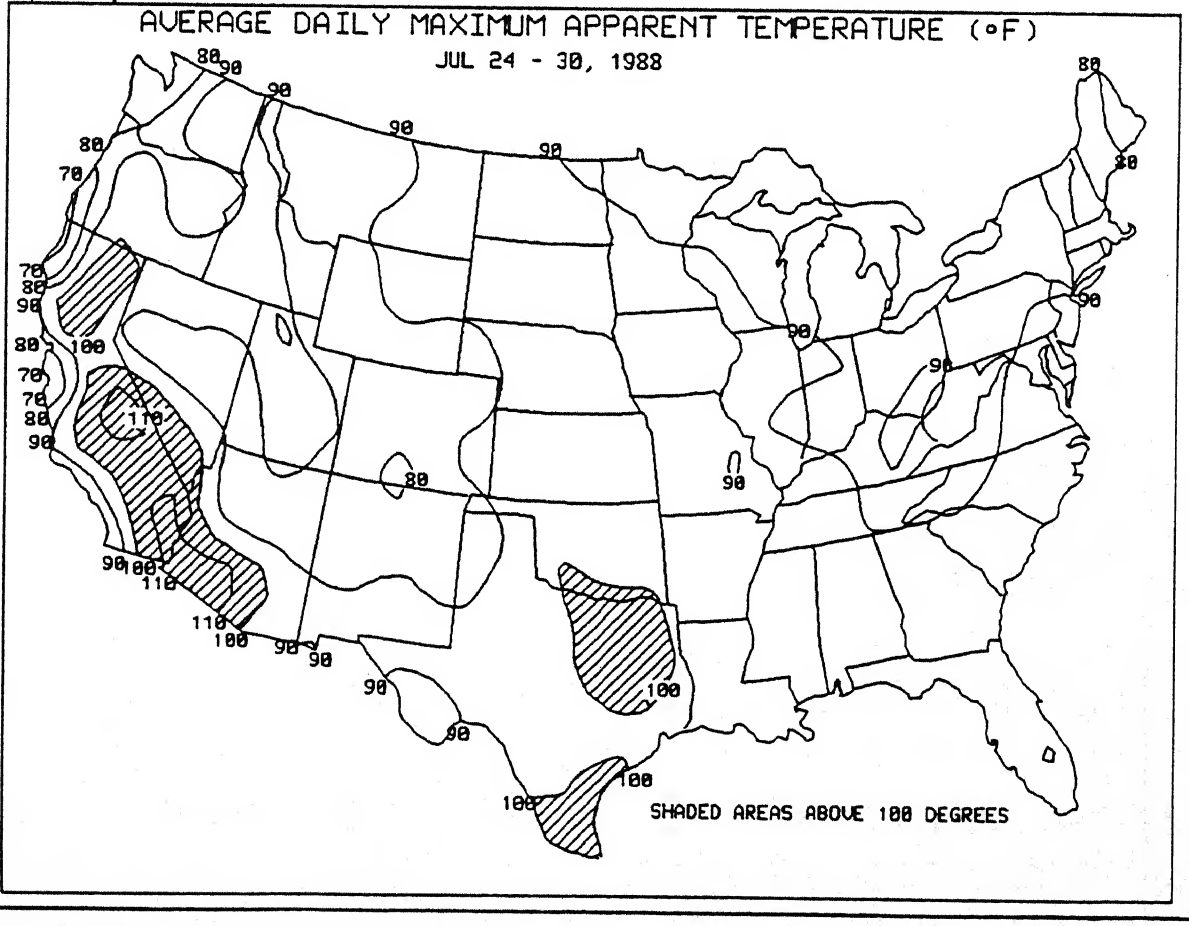
Figure 1. Extreme maximum temperatures (^{0}F) during July 24-30, 1988. Hot weather (temps>=100^{0}F) returned to the Great Plains while continuing to sizzle the Pacific Coast Interior.

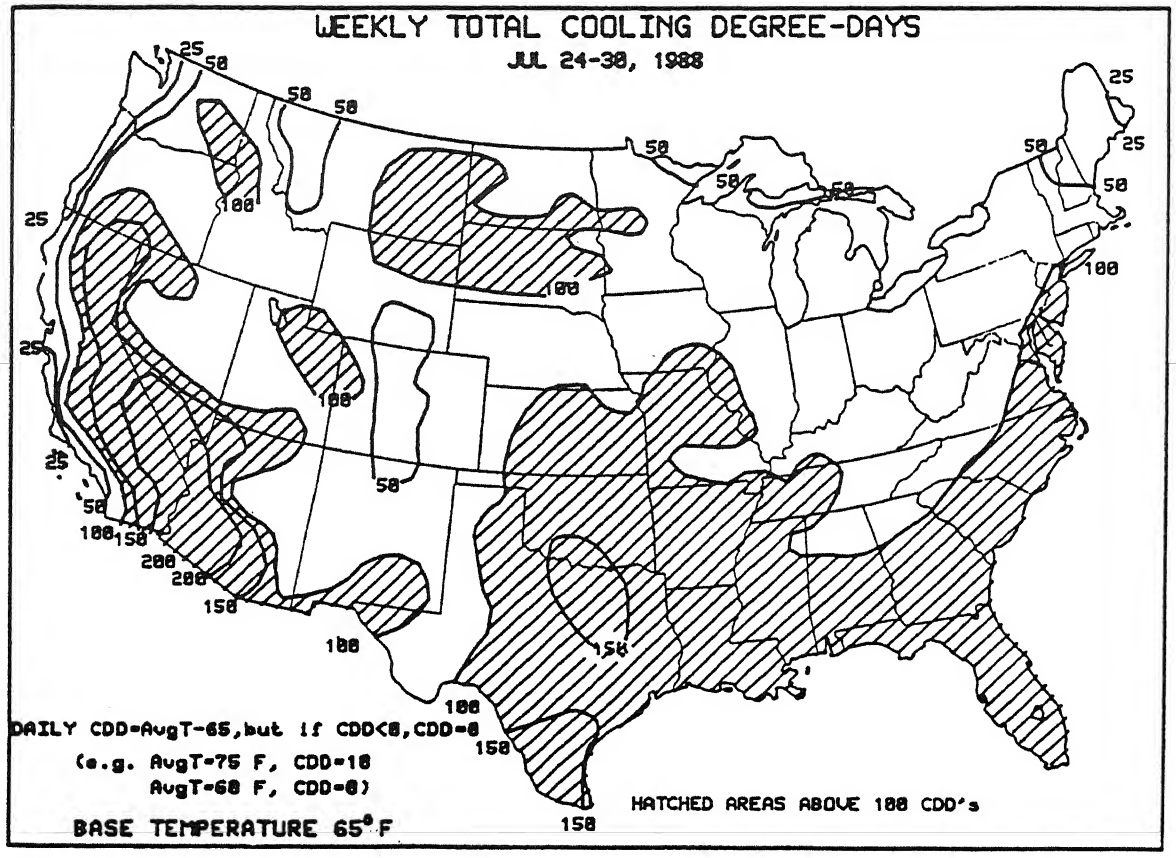


Highs averaged over 100^{0}F in northeastern Texas, the Dakotas, and throughout the desert Southwest and interior California as the warmth spread eastward by the end of the week.

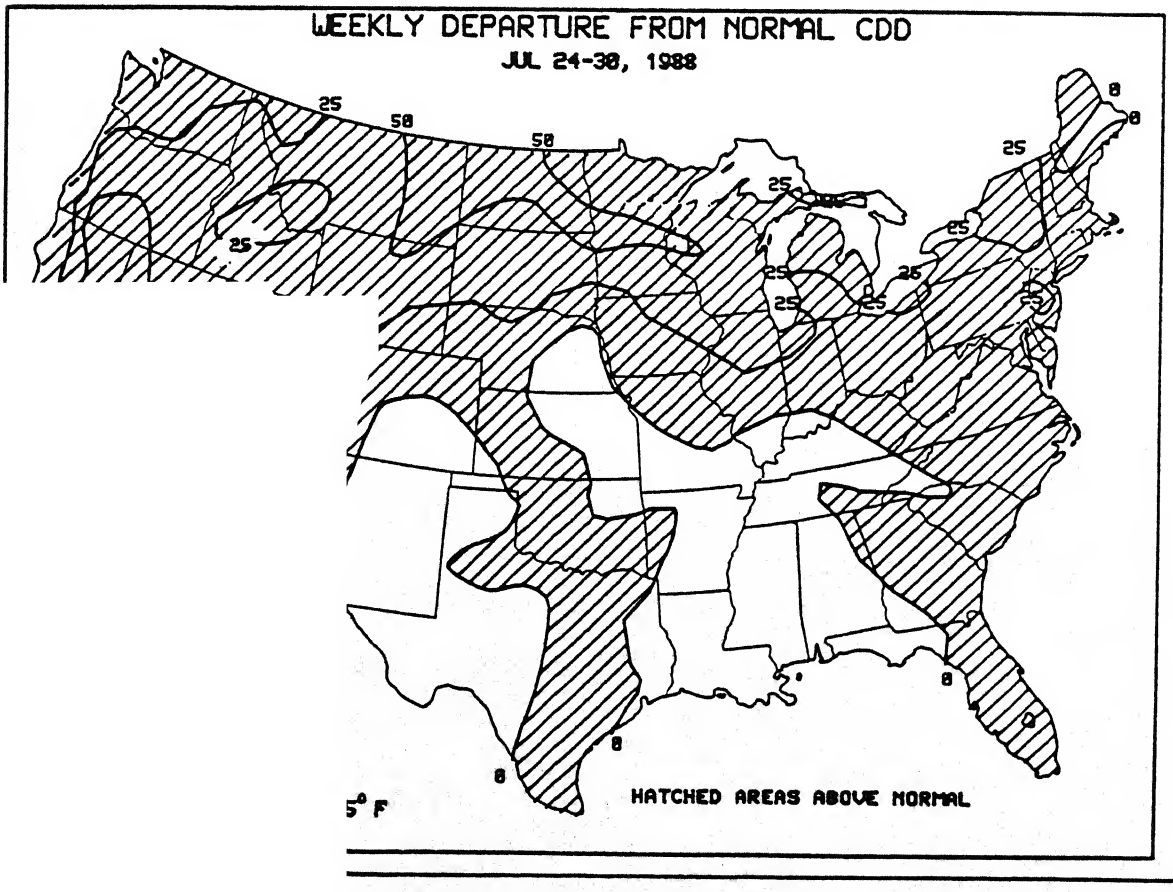


High relative humidities and warm weather combined to produce extreme apparent temperatures over 100°F at least once last week across the eastern U.S. (top), while consistently uncomfortable and dangerous (AppT >= 105°F) apparent temperatures existed in Texas, the desert Southwest, and the California interior (below).



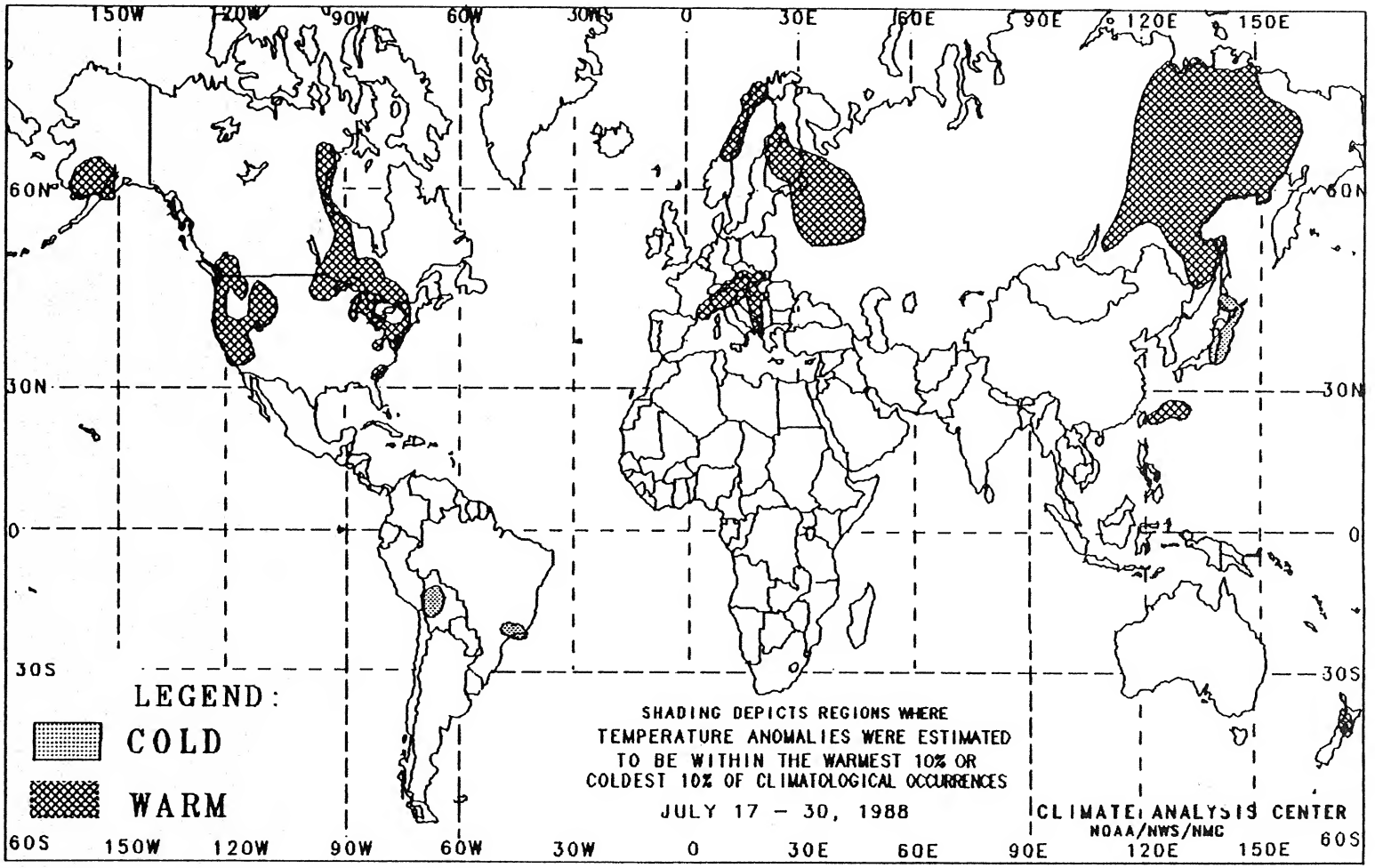


As summertime warmth normally reaches a peak by late July and early August, air conditioning (CDD) demand likewise attains a maximum. Last week was no exception as total CDD exceeded 100 in over half the country (top), and hot weather greatly increased the normal weekly CDD requirements (bottom).



GLOBAL TEMPERATURE ANOMALIES

2 Week



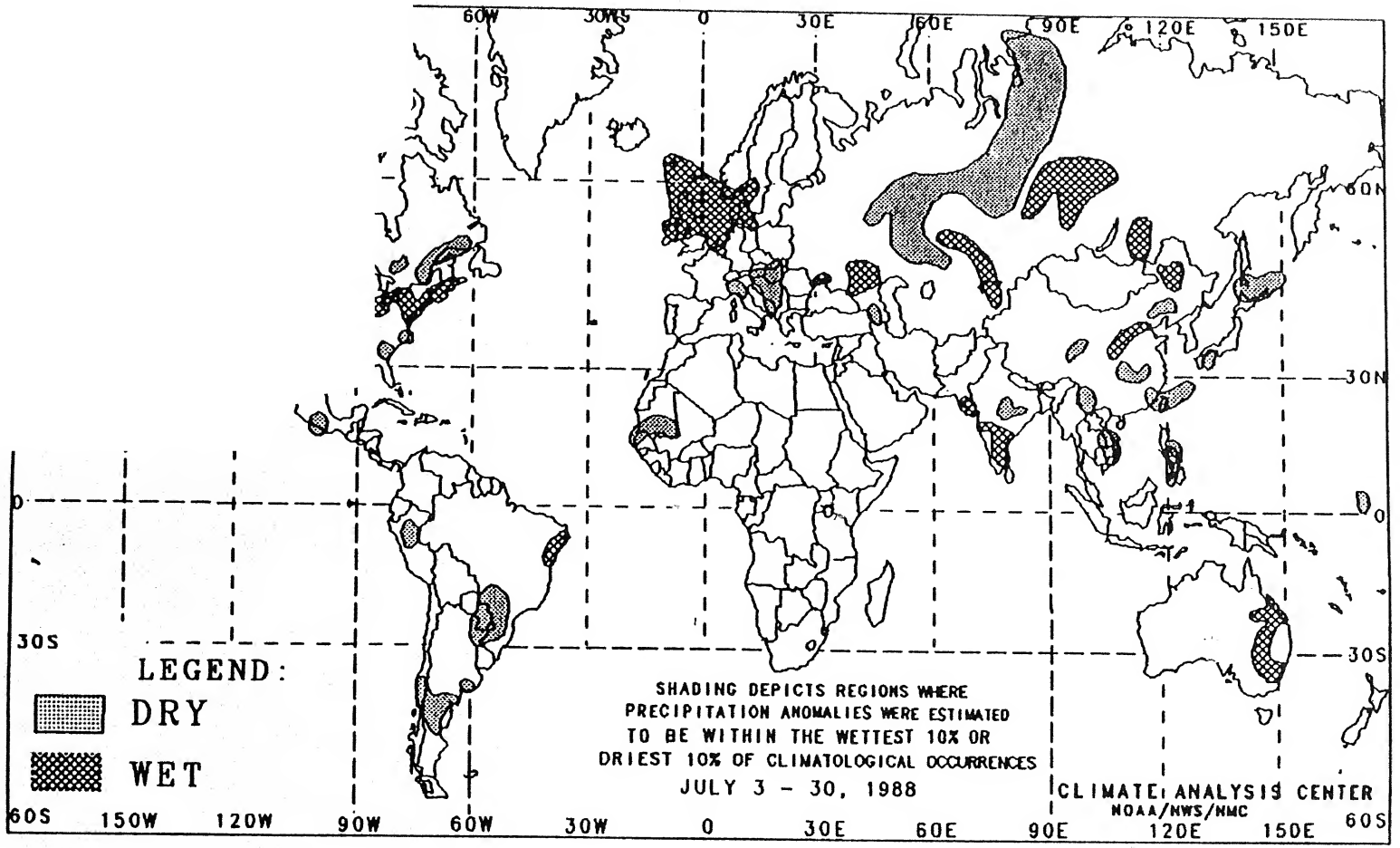
this chart are based on approximately 2500 which at least 13 days of temperature from synoptic reports. Many stations do not ur basis so many night time observations are f these missing observations the estimated ave a warm bias. This in turn may have on of the extent of some warm anomalies.

are not depicted unless the magnitude of normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining precentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

4 Week



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

SPECIAL CLIMATE SUMMARY

Climate Analysis Center, NMC
National Weather Service, NOAA

REGIONAL UPDATES OF THE 1988 DROUGHT: PRECIPITATION PERCENTAGES AND DEFICITS IN THE NORTHERN GREAT PLAINS/SOUTHERN CANADA, THE SOUTHEAST, AND THE MISSISSIPPI VALLEY.

During the past four weeks, rainfall has generally increased over the eastern half of the U.S. and provided short-term relief from the drought, especially to parts of the northern Great Plains, lower Mississippi Valley, Tennessee Valley, Ohio Valley, and New England (see front cover). Other areas, however, have not fared as well and had recorded less than half their normal precipitation since July 3. These areas included sections of the Missouri Valley, upper Midwest, middle Mississippi Valley, and southern Atlantic Coast states. Overall, the areal coverage of less than 50% of normal precipitation (figure not shown) since April 1 was basically unchanged from last week's figure (see Weekly Climate Bulletin dated 7/23/88, page 9) since most drought-afflicted regions received rainfall, but only light amounts. Below, a regional update of the northern Great Plains, Mississippi Valley, and Southeast is summarized by using each area's starting date (since March 20, April 3, and January 24, 1988, respectively) as determined in previous Weekly Climate Bulletins (WCB).

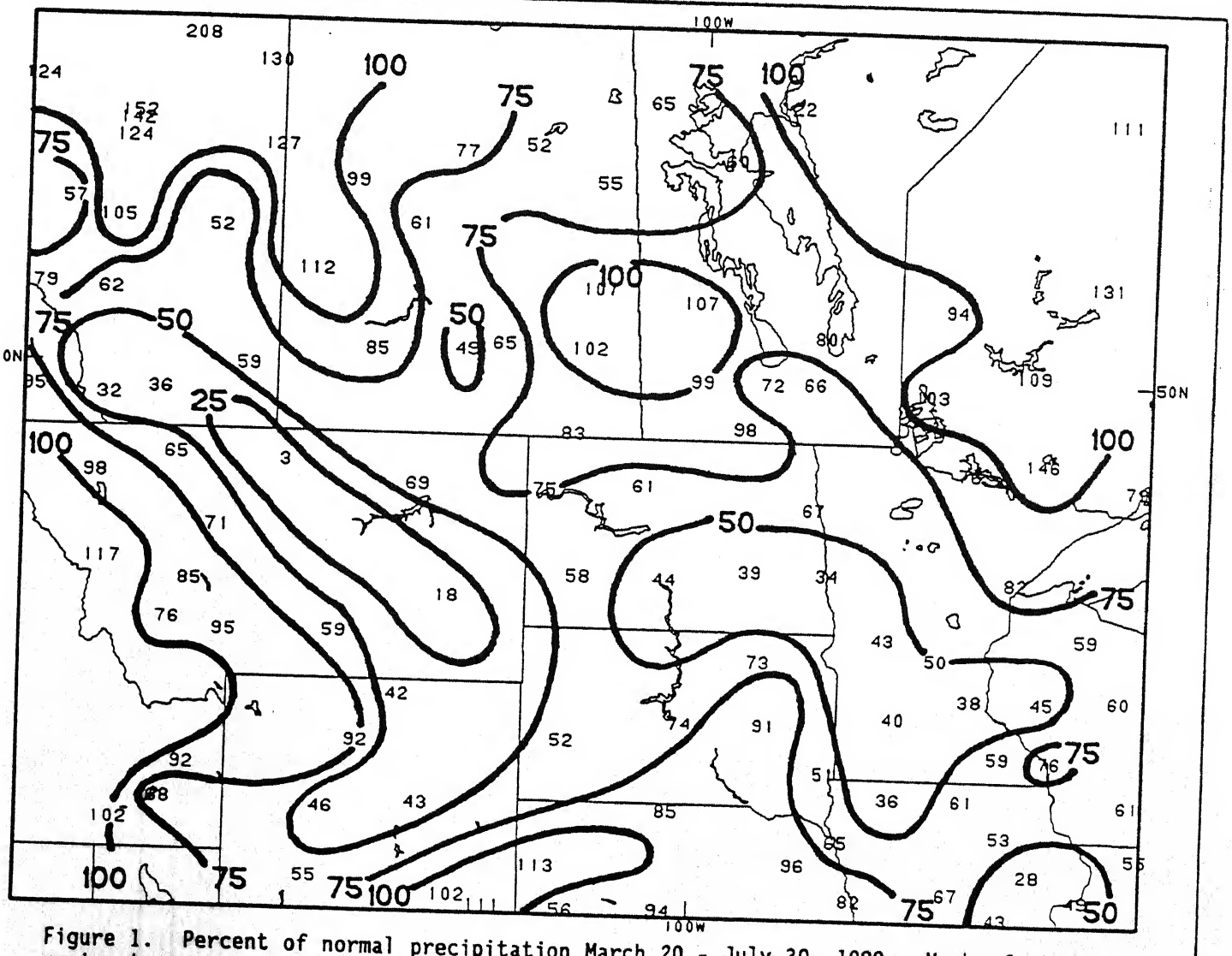


Figure 1. Percent of normal precipitation March 20 - July 30, 1988. Much of the region has measured below normal precipitation, and some locations have received less than 50%.

NORTHERN GREAT PLAINS/SOUTHERN CANADA (First WCB review 4/30/88):

Since March 20, areas of eastern Montana, northern Wyoming, southern North Dakota, southern Minnesota, and southern Alberta have reported less than half their normal precipitation (see Figure 1). Recent thunderstorms in the Dakotas and southern Saskatchewan have provided some relief, but deficiencies of 3 to 6 inches are common from southern Alberta southeastward into Wisconsin (see Figure 2).

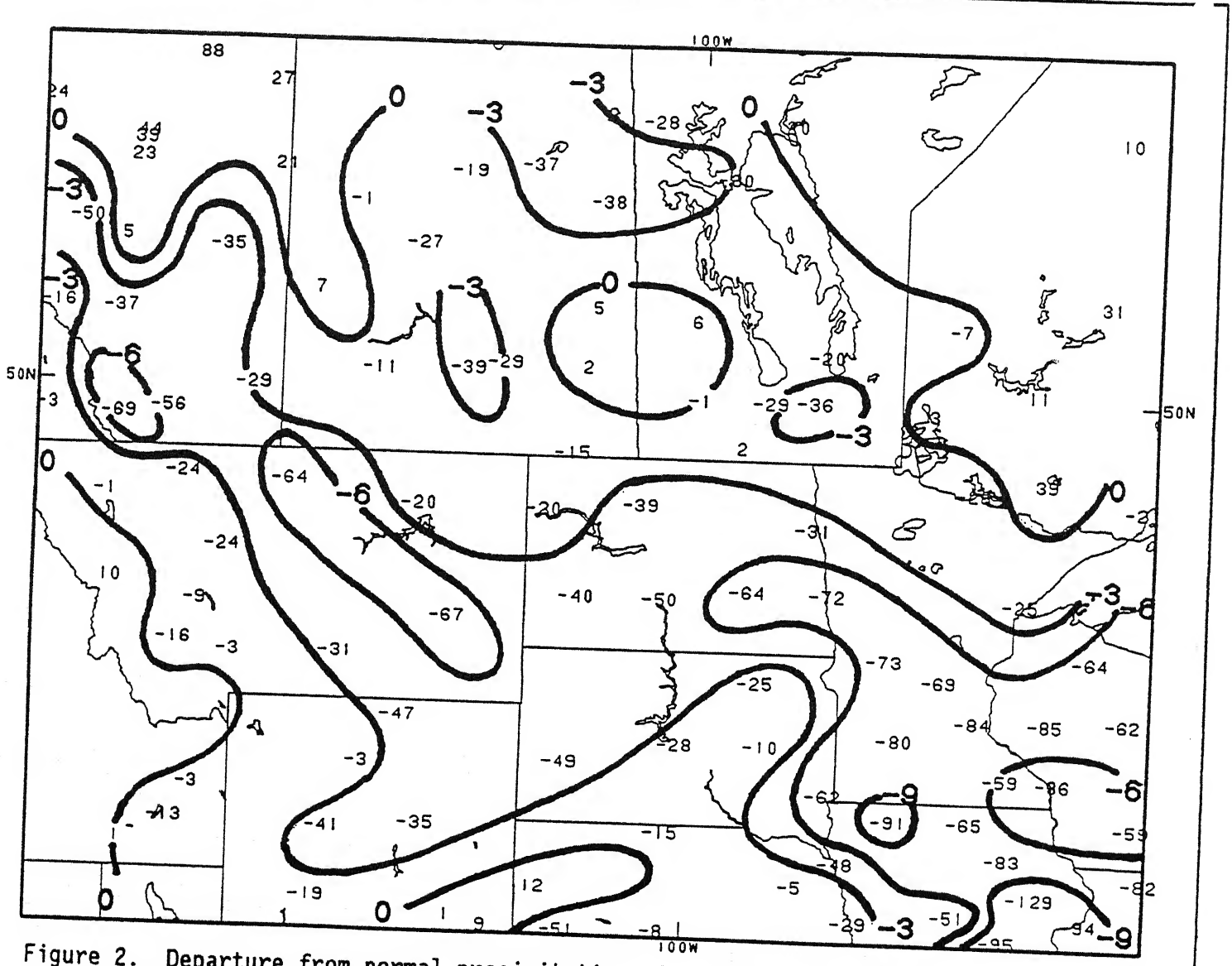


Figure 2. Departure from normal precipitation since March 20, 1988. Isopleths are in inches, and station values are in tenths of inches (e.g. -64 = -6.4 inches). Deficits of 3 to 7 inches are plentiful in the northern Great Plains and upper Midwest.

MISSISSIPPI VALLEY (First WCB review 5/21/88):

Recent precipitation across the lower Mississippi, Tennessee, and Ohio Valleys have increased percentages (see Figure 3) and decreased deficiencies (see Figure 4) from previous values, but some locations, most notably eastern Iowa, northern Illinois, and northern Missouri, and in northeastern Texas, northern Louisiana, and eastern Oklahoma have failed to receive substantial rainfall during the past four weeks. As a result, the previously mentioned areas have remained under 50% of normal precipitation since April 3, and deficits have surpassed 10 inches.

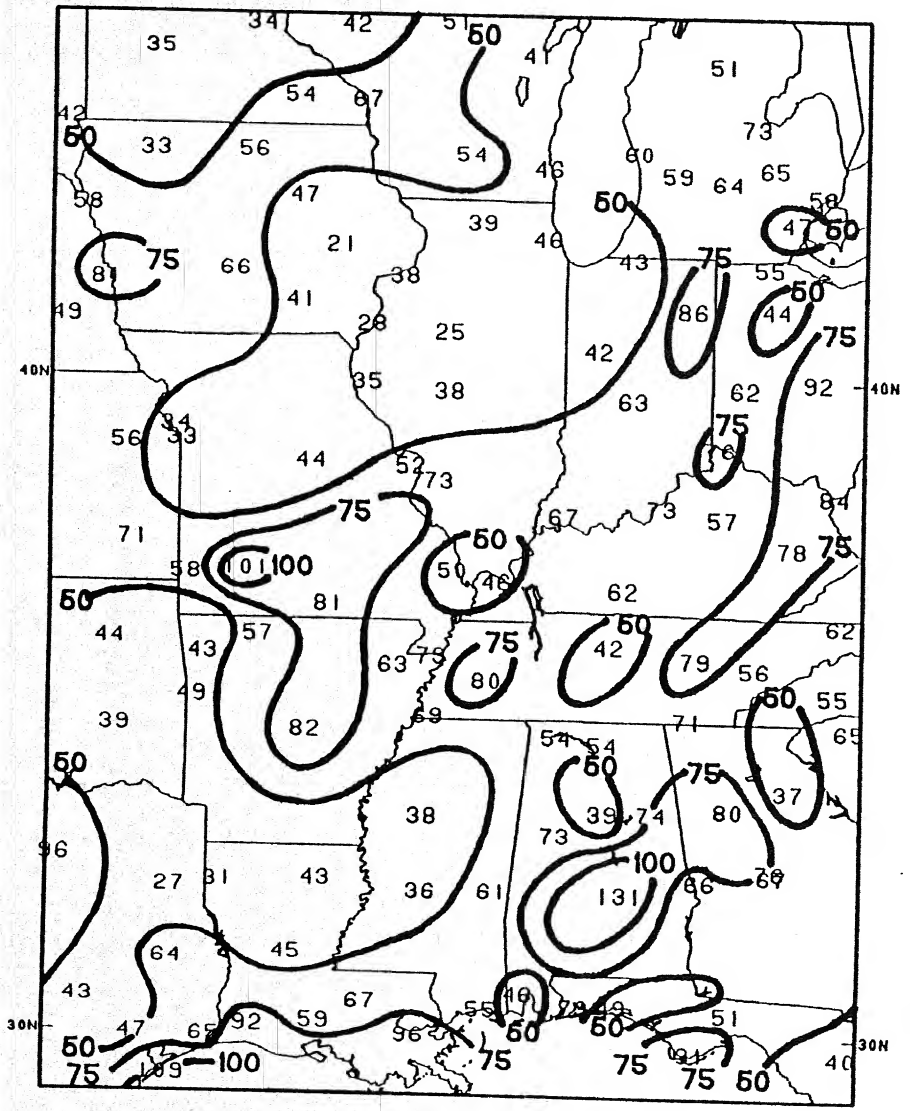


Figure 3. Percent of normal precipitation during April 3 - July 30, 1988. Much of the middle and lower Mississippi Valleys have reported under 50% of their normal rainfall.

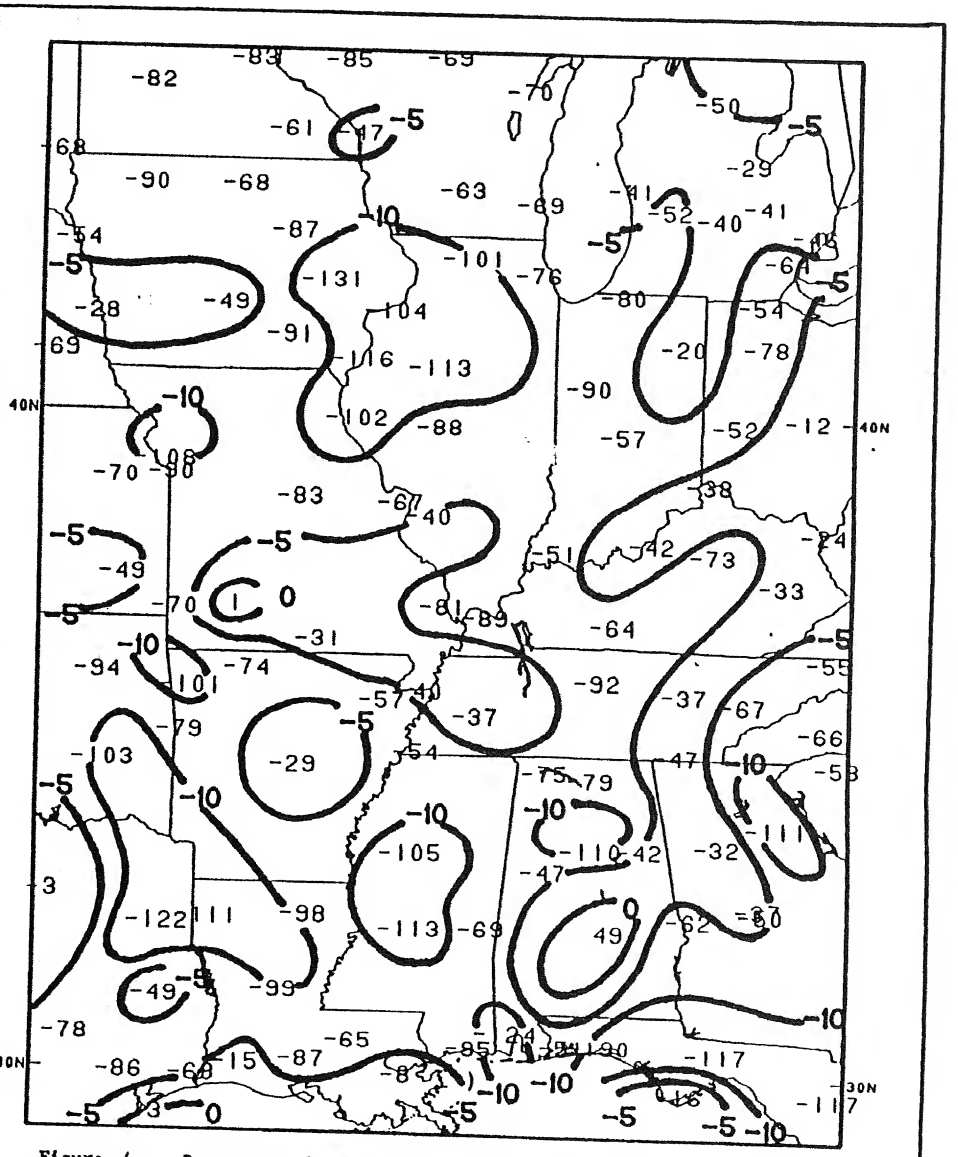


Figure 4. Departure from normal precipitation from 4/3-7/30/88. Isopleths are in inches and station values are in tenths of inches (e.g. -113 = -11.3 inches). Long-term deficits have surpassed ten inches at several stations in the area.

SOUTHEASTERN UNITED STATES (First WCB review 3/26/88):

The Southeast, especially the Tennessee Valley, has been experiencing below normal precipitation for the past four years. This year's dryness began in late January (Jan. 24), and even though the region had experienced several weeks of substantial precipitation in the late Spring, departures of more than 15 inches have accumulated over the last six months (see Figure 5). These same areas have approximately measured under 50% of their normal precipitation (see Figure 6). Although most stations received heavy rainfall in July that greatly decreased their deficits, much more rainfall will be needed to ease long-term deficiencies and reverse the adverse hydrological impacts (e.g. lake and river levels and water quality, subsoil moisture, etc.) created during the past four years.

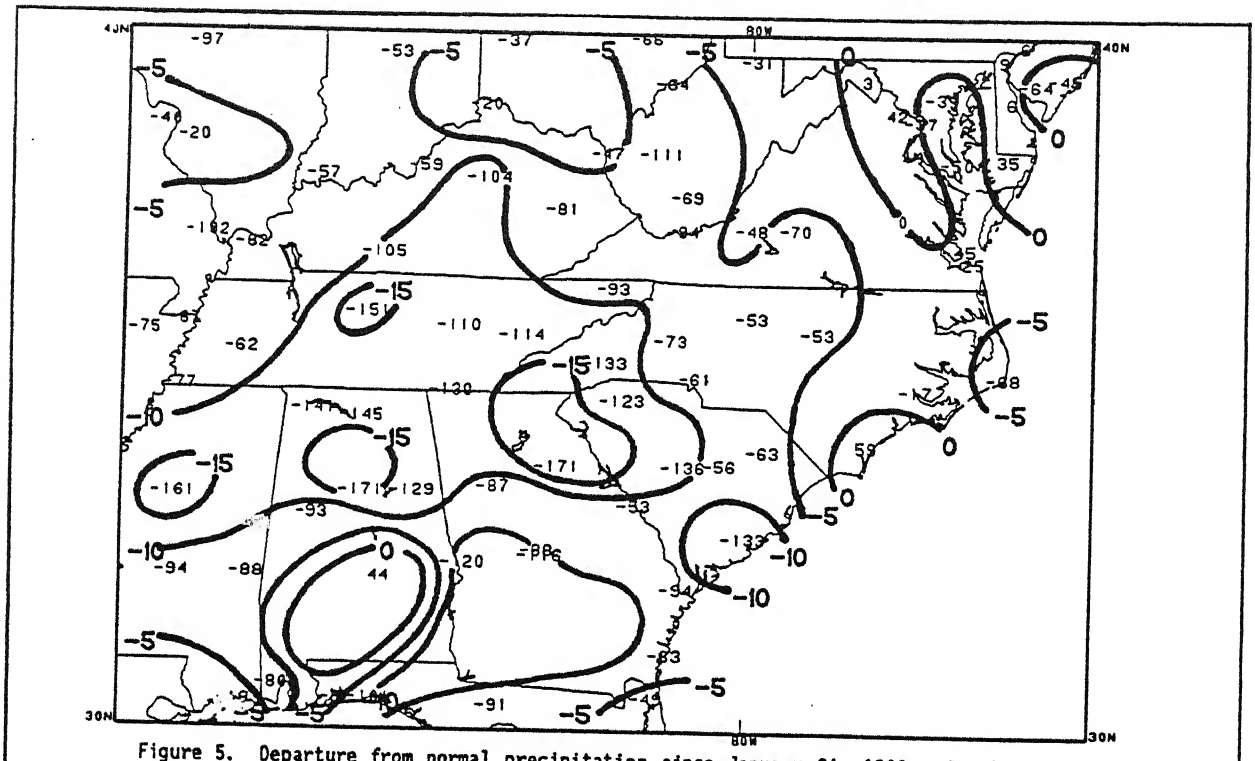


Figure 5. Departure from normal precipitation since January 24, 1988. Isopleths are in inches and station values are in tenths of inches (e.g. -171 = -17.1 inches). During the past six months, below normal precipitation has accumulated deficits of more than 15 inches.

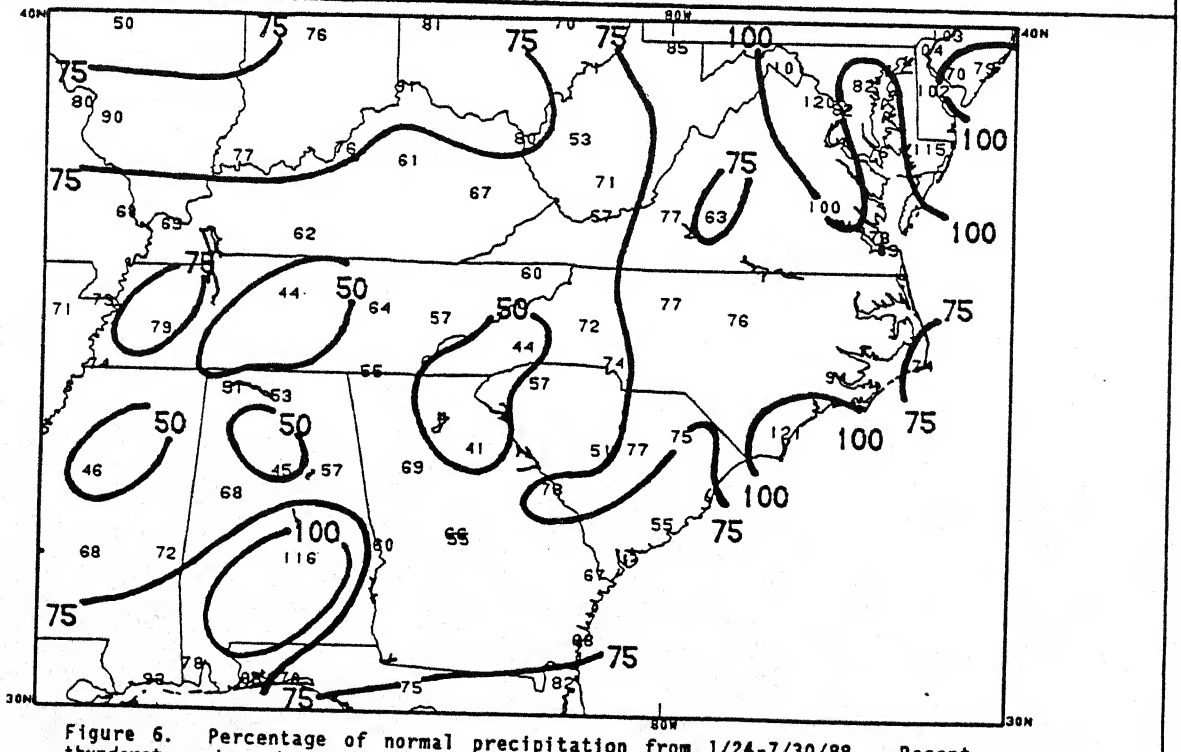


Figure 6. Percentage of normal precipitation from 1/24-7/30/88. Recent thunderstorms have decreased the areal coverage of <50%, but much of the Southeast still suffers from subnormal precipitation this year.

SPECIAL CLIMATE SUMMARY

Climate Analysis Center, NMC
National Weather Service, NOAA

COLD WAVE HITS BRAZILIAN COFFEE REGION

Cold weather invaded much of Paraguay, Uruguay, and southeastern Brazil last week as daily minimum temperatures dipped below the freezing mark ($0^{o}C$). Lowest readings ($-3.6^{o}C$ at Irati, Parana on 7/25) occurred early in the week as the states of Rio Grande do Sul, Santa Catarina, Parana, and Sao Paulo recorded temperatures under $0^{o}C$ (see Figure 1), while press reports stated that parts of Minas Gerais also experienced successive days of subfreezing temperatures. Up to 70% of Brazil's coffee crop is grown in the east-central region.

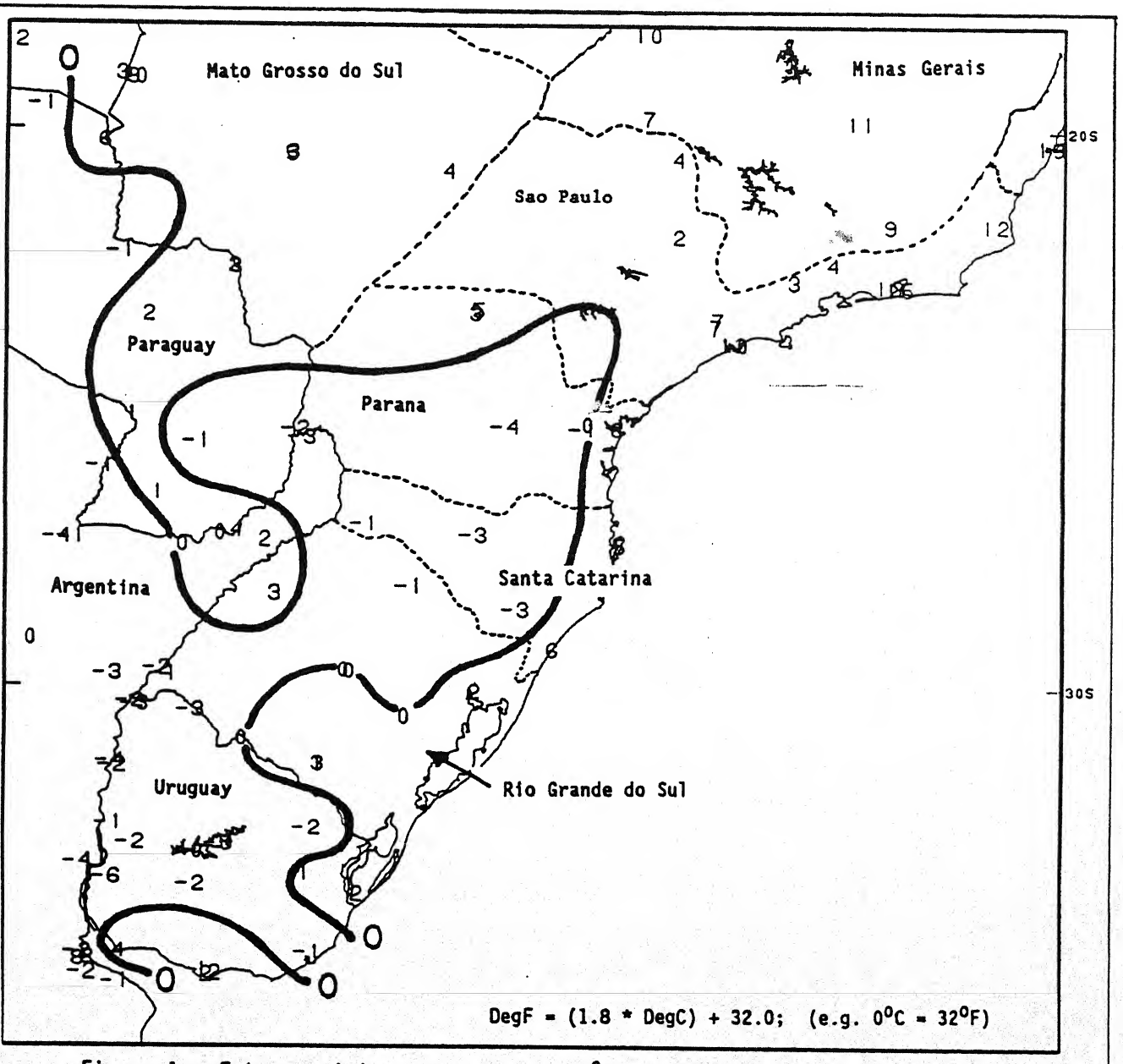


Figure 1. Extreme minimum temperatures (^{o}C) from 7/24-7/30/88. Coldest conditions occurred early in the week as temperatures fell as low as $-3.6^{o}C$ at Irati, Parana, Brazil on 7/25.

Temperatures averaged below normal throughout the southeastern Brazilian coffee area last week (see Figure 2). Largest departures (less than -4°C) were located over northeastern Paraguay and central Sao Paulo state. Prolonged cold is the primary fear of most growers, however, based upon the preliminary meteorological data, minimum temperatures in the area increased and remained above the freezing mark during July 27-30, thereby eliminating the threat of continued coldness.

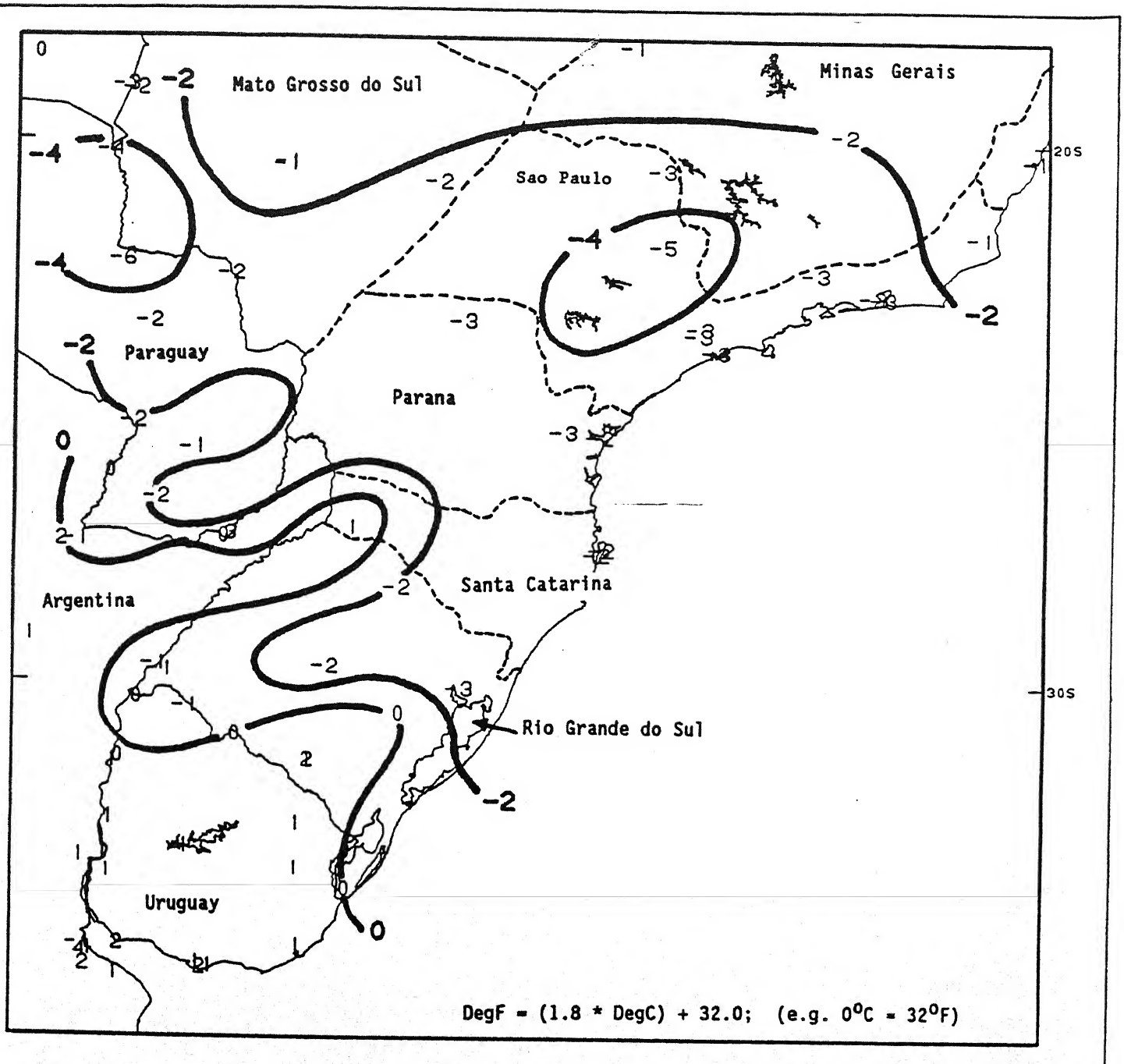


Figure 2. Departure from normal temperatures (°C) during July 24-30, 1988. Much of the Brazilian coffee region experienced abnormally cold weather.